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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A standard method for performing leakage test of direct-reading tactical dosimeters of the sealed or pump-down types. The procedure is designed for normal ambient conditions but can be used in other environments with the necessary precautions.			

US ARMY TEST AND EVALUATION COMMAND
TEST OPERATIONS PROCEDURE

DRSTE-RP-702-105
TEST OPERATIONS PROCEDURE 6-2-563
AD No. A090591

29 August 1980

RADIAC DOSIMETER LEAKAGE TEST

<u>Paragraph</u>	<u>Page</u>
1. SCOPE	1
2. FACILITIES AND INSTRUMENTATION	1
3. PREPARATION FOR TEST	1
4. TEST CONTROLS	2
5. PERFORMANCE TEST	2
6. DATA REDUCTION AND PRESENTATION	2
Appendix A. CHECKLIST	A-1

1.0 SCOPE

The objective of this test operations procedure (TOP) is to standardize methods for performing Direct Reading Dosimeter Electrical Leakage tests. This test should be run at normal (ambient) conditions, but, if required may be run during environmental and dynamic tests. Only ambient conditions are considered in this TOP.

2.0 FACILITIES AND INSTRUMENTATION

2.1 A radiation free area with controlled temperature and humidity (see para 4.3).

2.2 Instrumentation

Accuracy

Timer, 24 hour, minimum	<u>+1</u> minute
Light Source	as appropriate
Charger/Pumper	as appropriate
Hygrothermograph	<u>±</u> 2% of full scale

3.0 PREPARATION FOR TEST

3.1 Thoroughly inspect the dosimeters for visual, mechanical, and optical defects. Dosimeters with loose optical components, sticky reticle, darkened scale, missing or broken clip, etc. should be rejected. All defects will be recorded in the Test Project Notebook, if appropriate, before proceeding with the test.

3.2 Record on the data sheet each dosimeter's type (IM 9E, IM 147, etc), serial number (SN) and manufacturer (Mfr). (Columns 1 and 2 of the data sheet should be used for each type.

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4.0 TEST CONTROLS

4.1 Vacuum pump each dosimeter (if required), charged to maximum (zeroed) with the applicable charger and stored in a radiation free area for a minimum period of 24 hours. Make test periods exact multiples of 24 hours to facilitate computation.

4.2 Rotate charger knob slowly during charging to verify that the reticle can freely move over the entire range of the scale.

4.3 Point the dosimeter, after zeroing, at an appropriate light source and read the "zero set" value. Record this value in column 3 of the data sheet.

NOTE: The zero set value does not have to be exactly zero. It must be above zero, but should be within the lower 10 percent of full scale for the initial test. (Example: No greater than 20 for a scale of 0-200 milliroentgens.) The test may be repeated at midscale or near full scale if desired, or if there is reason to believe the leakage is not linear across the scale. The test should be conducted in a controlled temperature and humidity environment in case the leakage is affected by these parameters. It may also be necessary to conduct this test in high and low temperature and high humidity environments; however, these tests are not addressed in this TOP. (See para 1.)

5.0 PERFORMANCE TEST

5.1 Read each dosimeter at end of the leakage test period and record the value in column 4 of the data sheet as "final reading". Subtract column 3 from column 4 to obtain the "net leakage" in column 5. Divide the total leakage by this multiple (2 or 3) to obtain the "leakage per day" if the total leakage period is a multiple of 24 hours (48 or 72).

NOTE: After zeroing, the dosimeters must be handled very gently to avoid shifting the zero by a tap or shock.

5.2 Clean the insulator for dosimeters exhibiting a leakage rate greater than the specification, by using procedures prescribed in the manual. Repeat the leakage test for two additional 24-hour periods. If the leakage remains out of specification, the results will be recorded as a deficiency and the SN noted. These leakages should not be used for personnel dosimetry.

6.0 DATA REDUCTION & PRESENTATION

6.1 Compare the actual leakage in rads/day or millirads/day to the maximum permissible leakage to determine if the dosimeter meets the requirements. Group means and standard deviations may be calculated to enhance data presentation. Clearly label or "red tag" rejected dosimeters (DA Form 2417 attached) to preclude usage until final disposition.

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